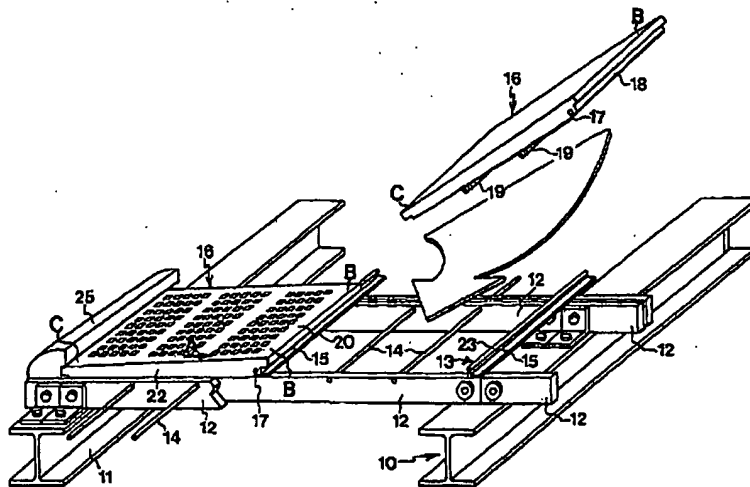




## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(54) Title: SCREEN WITH OVERLAPPING ELONGATE SCREEN CLOTH ELEMENTS



## (57) Abstract

A screen comprises a screen frame (10) and successively mounted and mutually overlapping screen cloth elements (16). The downstream end (B) of the screen cloth elements is secured to the screen frame (10) by snap lock means (13, 23; 17, 18), whereas their upstream end (C) is clamped between the screen frame (10) and a portion (20) of the following screen cloth element, provided outside the snap lock means (13, 23; 17, 18). According to the invention, the screen cloth elements (16) have additional snap lock means (17, 19; 14) at least at one location between its ends (B, C). The one part (17, 19) of these additional snap lock means (17, 19; 14) projects further from the underside of the screen cloth element than the part (18) of the snap lock means positioned at the downstream end (B) of the screen cloth element in order to be able to extend downwards between guide means (12) included in the screen frame (10). The other part (14) of the additional snap lock means has the form of a strut element (14) extending between said guide means (12).

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SCREEN WITH OVERLAPPING ELONGATE SCREEN CLOTH ELEMENTS

The present invention relates to a screen with overlapping elongate screen cloth elements. Screens and screen cloth elements of this type are extensively used and are known e.g. from SE-B-460340 and PCT publication  
5 WO9611070. These screens comprise a screen frame and successively mounted and mutually overlapping screen cloth elements. The screen cloth elements are at one end secured to the screen frame by snap lock means, the other end of the screen cloth elements being clamped between  
10 the screen frame and a portion of the following screen cloth element provided outside the snap lock means. One part of the snap lock means projects from the underside of the screen cloth element, whereas the other part of said snap lock means is arranged at the upper edge of  
15 supporting elements included in the screen frame. In some of the commercially available screens of these types, the screen cloth elements are elongate with a length of about 50 cm and a width of about 30 cm. In some embodiments these elements have a length of about 100 cm and a width  
20 of about 60 cm. A major advantage of these screens, as well as the screens according to SE-B-422418 and its counterpart US-A-4,141,821, is that the separate screen cloth elements can be exchanged when worn to a greater extent than other screen cloth elements in the same  
25 screening device. Compared to the screens according to SE-B-422418, the screens according to SE-B-460340 and WO9611070, however, have the advantage of being considerably easier to mount and dismount, even when a separate screen cloth element in the centre of a large  
30 screening surface is involved.

The screens and screen cloth elements according to SE-B-460340 and WO9611070 function well if they contain a rigid reinforcement frame. In some screen applications it is, however, desirable to use elongate screen cloth ele-

ments, which are unreinforced or reinforced with flexible reinforcement material. However, the above-mentioned prior art screen and screen cloth design according to SE-B-460340 and WO9611070 does not function in a completely satisfying way in such screen applications. The rigid reinforcement frame is generally made of metallic material, in particular steel, which can cause difficulties from the point of view of recycling.

To this end, one object of the present invention is to provide a screen and a screen cloth element of the elongate type as disclosed in SE-B-460340 and WO9611070, which could be formed of an unreinforced elastomeric material or of an elastomeric material reinforced with flexible reinforcement material, while maintaining the advantageous characteristics of this screen or this screen cloth element.

This and other objects of the invention are achieved by a screen and a screen cloth element in accordance with the independent claims 1 and 6. In the dependent claims, particularly preferred embodiments of the screen and the screen cloth element, respectively, are stated.

To sum up, the invention thus relates to a screen with a screen frame and successively mounted and mutually overlapping screen cloth elements. The downstream end of these elements is secured to the screen frame by snap lock means, whereas their upstream end is clamped between the screen frame and a portion of the following screen cloth element, provided outside the snap lock means. According to the invention, each screen cloth element has additional snap lock means at least at one location between the upstream and the downstream ends. The one part of these additional snap lock means projects further from the underside of the screen cloth element than the part of the snap lock means positioned at the downstream end of the screen cloth element in order to be able to extend downwards between guide means included in the screen frame. The other part of the additional snap lock

means has the form of a strut element extending between said guide means.

DK-B-145528 and its counterpart EP-0062675-B2 disclose a screen, which has a supporting grate consisting of two layers of intersecting bars arranged at different levels, square screen cloth elements being secured to the upper layer of bars by the underside of the screen cloth elements having guiding grooves of such a depth that the screen cloth elements in their mounted state abut against the upper side of the bars in the lower layer of bars. The guiding grooves are formed with such a profile that after assembly the guiding grooves will engage the upper layer of bars in the supporting grate by snap lock action. This prior art screen design can certainly use screen cloth elements of unreinforced elastomeric material, but these publications do not indicate how the disclosed technique could be modified to be used in screens, whose screen cloth elements are elongate and mounted overlappingly in analogy with that disclosed in SE-B-460340 and WO9611070, respectively. In DK-B-145528 and counterpart EP-0062675-B2, all snap lock means on the underside of the screen cloth elements are designed in the same way, and nothing indicates that the snap lock means arranged between the ends of the screen cloth element should have their part connected with the screen cloth element designed so as to protrude further from the underside of the screen cloth element than the part of the snap lock means provided at the end of the screen cloth element in order to extend downwards between guide means included in the screen frame.

A particularly preferred embodiment of the invention will be described hereinbelow with reference to the accompanying drawings. Fig. 1 is a schematic perspective view of an example of a screen with screen cloth elements according to the present invention. Fig. 2 is a bottom view of a screen cloth element. Fig. 3 is a section taken

along the line III-III in Fig. 2. Fig. 4 is a longitudinal section through a portion of the screen.

Fig. 1 shows schematically a screen with a screen frame 10 having transverse supporting beams 11. Longitudinal screen frame elements 12 are secured to these transverse supporting beams. These longitudinal screen frame elements 12 in turn support transverse strut elements 13, 14. The strut elements 14 are secured at a lower level than the upper edge of the screen frame elements 12. The strut elements 13 are L-shaped and arranged in such a way that their upper edge is located at a higher level than the upper edge of the screen frame elements 12 and one of their legs forms an abutment surface 15. The strut elements 13 can, however, have a different shape, and the abutment surface 15 can be formed on a separate, transverse element in the screen frame 10.

Elongate screen cloth elements 16 are mounted in the screen frame by snap lock means, whose one part is formed by the strut elements 13, 14. The strut elements 13 have a thickened portion 23 at their upper edge. In the embodiment of Fig. 1, the strut element 14 consists of a round bar, whereas in the embodiment of Figs 2 to 4, it has the form of a flat iron bar with a thickened portion 24 at its upper edge. The other part of the snap lock means is formed by snap lock recesses 17 in transverse ribs 18, 19 on the underside of the screen cloth elements. The rib 18 positioned nearest to the downstream end B (i.e. the last end, seen in the screening direction A) of the screen cloth element 16 is spaced from the end of the screen cloth element so as to provide the screen cloth element with a projecting portion 20 outside the rib 18. The purpose of this projecting portion is to clamp the upstream end C of the following screen cloth element against the abutment surface 15. According to the invention, the screen comprises, however, at least one additional snap lock means between the ends of the screen cloth element. In the shown example, there are two such additional snap

lock means, which include the ribs 19 with the recesses 17 and the transverse struts 14. The number of additional snap lock means depends on the length of the screen cloth element. Thus, one, two or even more additional snap lock means can be used.

By the use of additional snap lock means, it is possible to dispense with the prior art rigid reinforcement in the screen cloth elements. It is preferable to form the screen cloth element completely without reinforcement means, but it is possible to cast flexible reinforcement means of organic or inorganic material into the screen cloth elements. The screen cloth elements are preferably made of elastomeric material, preferably polyurethane. Combinations of different types of elastomeric materials can also be used, e.g. rubber and polyurethane. For flexible reinforcement means, if any, it is advantageous to use cord material or bars of organic material, in particular polyester, polyamide or polyaramide material. Preferably glass fibre material is used as flexible inorganic reinforcement material.

The possibility of dispensing with rigid reinforcement means in elongate, overlapping screen cloth elements is achieved on the one hand, by the use of said additional snap lock means and, on the other, by the fact that the ribs 19 project further from the underside of the screen cloth elements than do the ribs 18 so as to enable the ribs 19 to extend downwards between the screen frame elements 12, which is rendered possible through the arrangement of the transverse struts 14 at a lower level than the upper edge of the screen frame elements 12.

In accordance with a particularly preferred embodiment, a further improvement of the function of the screen cloth elements can be obtained if reinforcing inclined supports 21 are formed on one side or on both sides of the ribs 18, 19. An even better result is obtained if, in addition, the screen cloth elements are formed with longitudinal reinforcement ribs 22 which are disposed at

least on the long side edges of the screen cloth elements and which project from the underside of the screen cloth elements and are bevelled, such that after assembly they can rest on the upper edge of the longitudinal screen frame elements 12. As indicated by dot-dash lines, longitudinal reinforcing ribs 23 can, however, be formed in other places as well between the long sides of the screen cloth elements.

When mounting the screen cloth elements on the screen frame, the screen cloth elements are mounted successively, so that one upstream end of the screen cloth elements is inserted under the projecting portion 20 of superjacent screen cloth elements in order to be secured between this and the subjacent abutment surface 15. Subsequently, the screen cloth element is successively pressed downwards to be secured to the screen frame also by the additional snap lock means 14, 17, 19, 24. The screen cloth element nearest to the upstream end of the screen is clamped in prior-art manner to the screen frame by means of a transverse hold-down strip 25.

The separate screen cloth elements 16 have through-holes, whose form depends on the type of screening work to be performed. Thus, the form and size of the holes can be varied without departing from the idea of the invention.



## CLAIMS

1. A screen comprising a screen frame (10) and  
5 successively mounted and mutually overlapping screen  
cloth elements (16) each secured to the screen frame (10)  
at their downstream end (B) by snap lock means (13, 23;  
17, 18) and at their upstream end (C) clamped between the  
screen frame (10) and a portion (20) of the following  
10 screen cloth element extending outside the snap lock  
means (13, 23; 17, 18), the one part (17, 18) of the snap  
lock means (13, 23; 17, 18) projecting from the underside  
of the screen cloth element, whereas the other part (13,  
23) of said snap lock means is arranged at the upper edge  
15 of supporting elements (13) included in the screen frame  
(10), characterised in that additional snap  
lock means (17, 19; 14, 24) are arranged between the ends  
(B, C) of each screen cloth element (16), the one part  
(17, 19) of said additional snap lock means (17, 19; 14,  
20 24) projecting further from the underside of the screen  
cloth element than the part (18) of the snap lock means  
positioned at the downstream end (B) of the screen cloth  
element, and extending downwards between guide means (12)  
included in the screen frame (10), and the other part  
25 (14) of said additional snap lock means having the form  
of a strut element (14, 24) extending between said guide  
means (12).

2. A screen according to claim 1, characterised  
30 in that said one part of the snap lock  
means (13, 14, 23, 24; 17, 18, 19) has the form of a  
transverse rib (18, 19) projecting from the underside of  
the screen cloth element.

3. A screen according to claim 2, characterised  
35 in that one or more reinforcing inclined  
supports (21) are provided on one or on both sides of the  
transverse ribs (18, 19).

4. A screen according to claim 1, 2 or 3, characterised in that the screen cloth elements (16) are unreinforced or reinforced with flexible reinforcement material.

5 5. A screen according to any one of claims 1-4, characterised in that the screen cloth elements (16) have one or more longitudinal reinforcing ribs (22) projecting from their underside.

6. A screen cloth element, which has a projecting  
10 portion (20) at its downstream end (B) and, inwardly thereof, one part (18) of a snap lock means (13, 15; 17, 18) projecting from the underside of the screen cloth element (16) for mounting the screen cloth element in a screen frame (10), characterised in that the  
15 screen cloth element (16) has, between its ends (B, C), one part (19) of additional snap lock means (17, 19) projecting from the underside, and that these additional parts (19) project further from the underside of the screen cloth element than said one part (18) of the snap  
20 lock means positioned at the downstream end and are intended to engage guide means (12) included in the screen frame (10) and extending in the longitudinal direction thereof.

7. A screen cloth element according to claim 6,  
25 characterised in that said one part (18, 19) of the snap lock means (13, 14, 23, 24; 17, 18, 19) has the form of a transverse rib (18, 19) projecting from the underside of the screen cloth element (16).

8. A screen cloth element according to claim 7,  
30 characterised in that one or more reinforcing inclined supports (21) are provided at one or both sides of the transverse ribs (18, 19).

9. A screen cloth element according to claim 6, 7 or 8, characterised in that it is unreinforced  
35 or reinforced with flexible reinforcement material.

10. A screen cloth element according to any one of claims 6-9, characterised in that it has one

or more longitudinal reinforcing ribs (22) projecting from its underside.

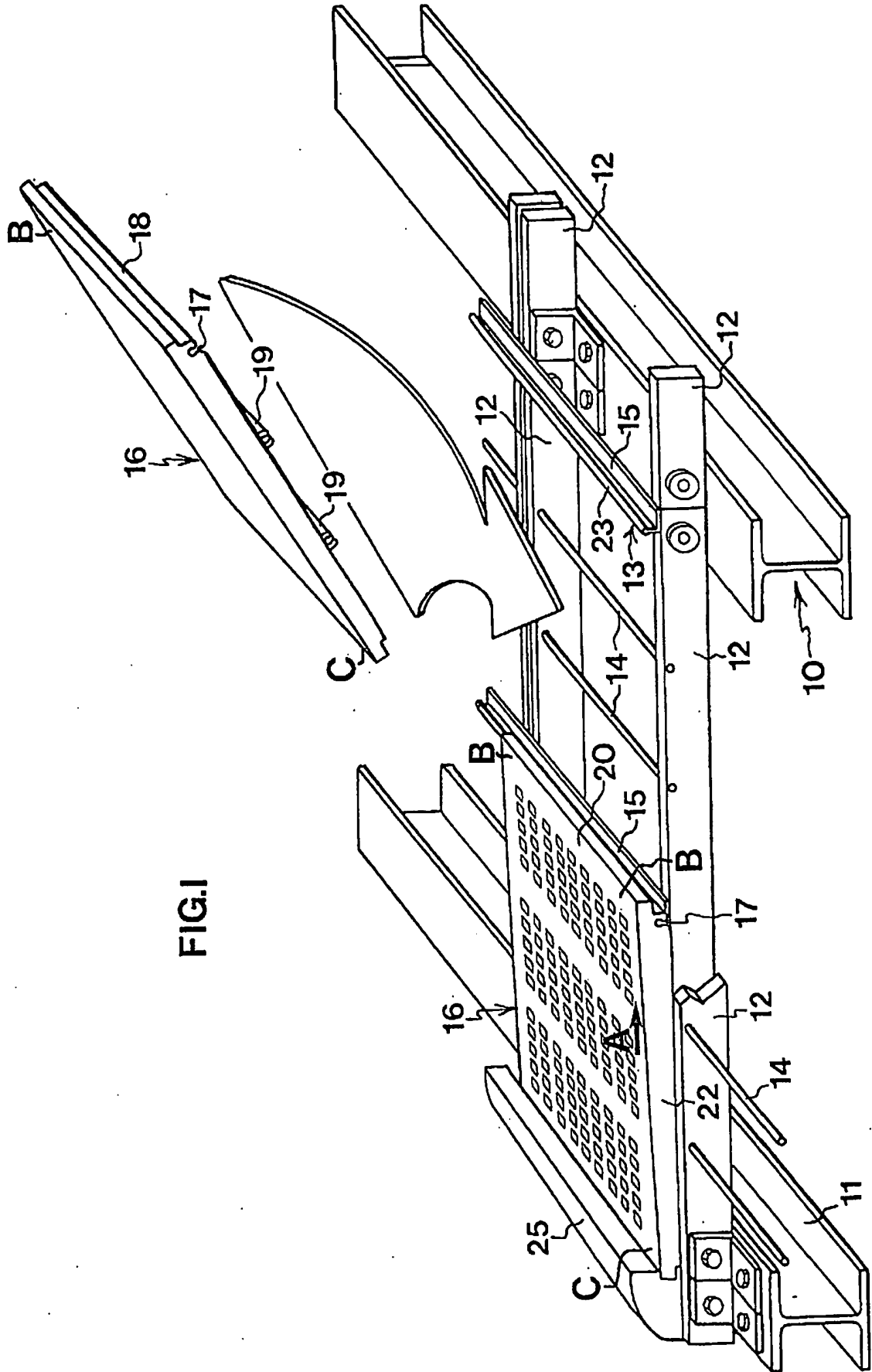


FIG.1

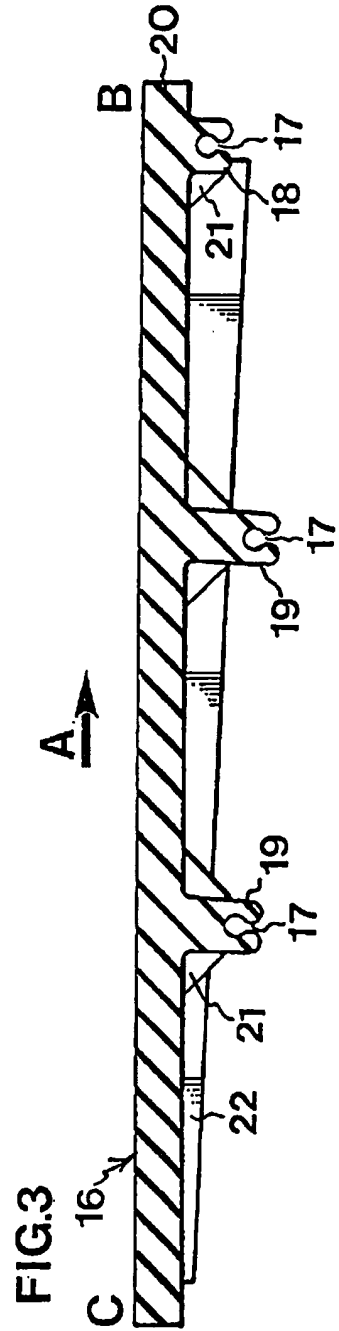
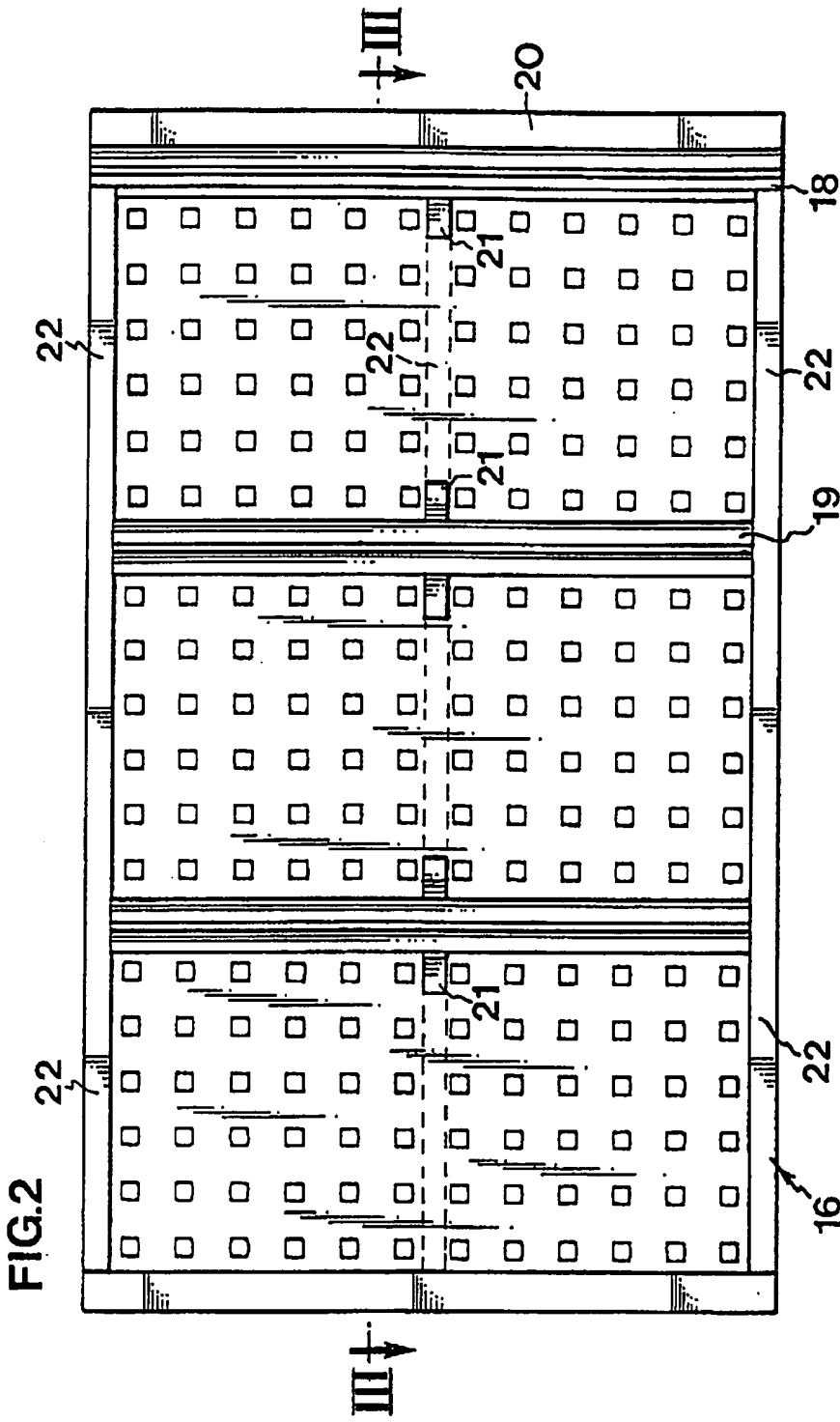
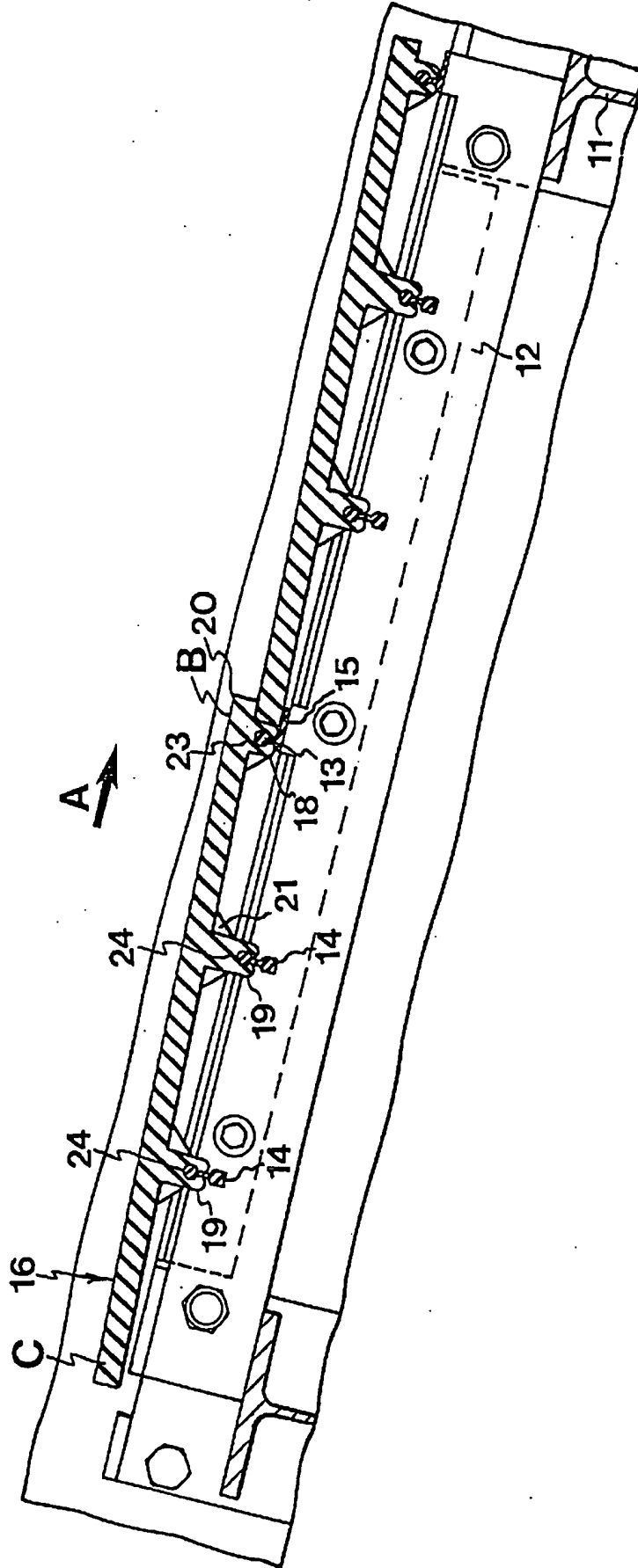


FIG.4



## INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 97/02105

<b>A. CLASSIFICATION OF SUBJECT MATTER</b>		
IPC6: B07B 1/46 According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b>		
Minimum documentation searched (classification system followed by classification symbols)		
IPC6: B07B		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
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Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 8908509 A1 (TRELLEBORG AB), 21 Sept 1989 (21.09.89), page 2, line 3 - page 3, line 13 --	1-10
A	WO 8402290 A1 (FIORIS PTY. LIMITED), 21 June 1984 (21.06.84), page 6, line 2 - page 7, line 27 --	1-10
A	EP 0167999 A2 (HEIN, LEHMANN AKTIENGESELLSCHAFT), 15 January 1986 (15.01.86), page 6, line 1 - page 7, line 16 -- -----	1-10
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.		
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27 March 1998		03 -04- 1998
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## INTERNATIONAL SEARCH REPORT

Information on patent family members

02/03/98

International application No.

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